5

ТЕТРАДЬ

для ______________________ ч 1

____

учени __________ класса __________

__________ школы __________

[illegible]

[illegible]

19. II. 2007թ.

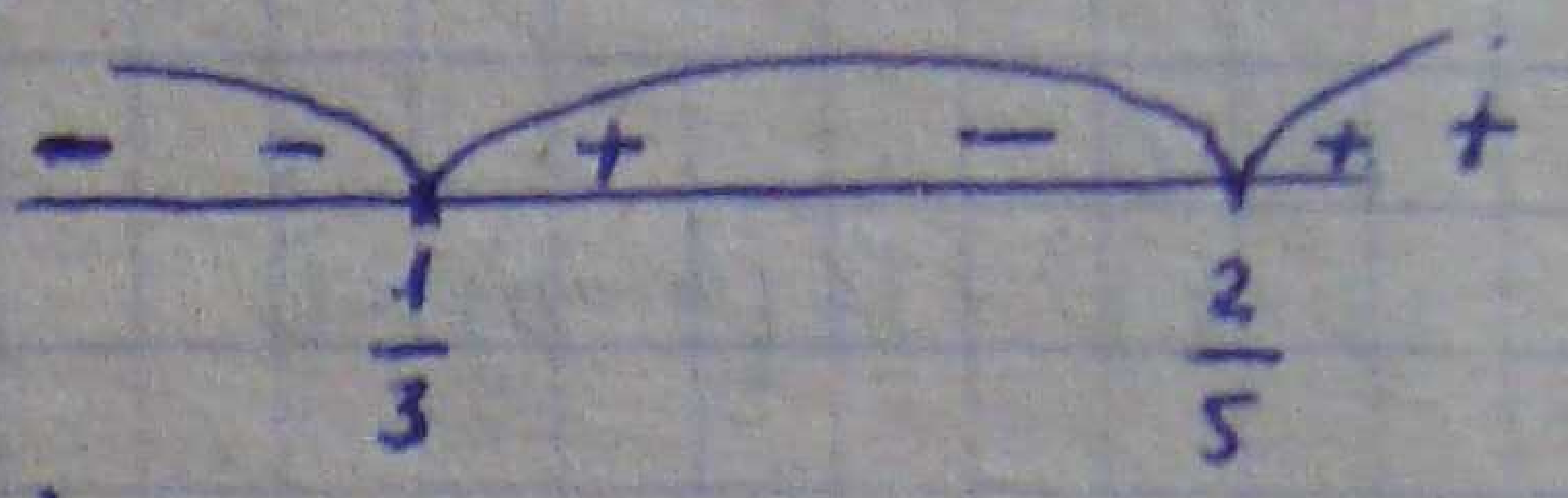
Տարբերակ 1.

2. Լուծել հավասարումը.

$$|3x-1|+|5x-2|=5$$

$3x-1=0$ $\quad$ $5x-2=0$

$x=\frac{1}{3}$ $\quad$ $x=\frac{2}{5}$



$$\left[\begin{array}{l}\begin{cases}x\in(-\infty;\frac{1}{3})\\1-3x+2-5x=5\end{cases}\\\begin{cases}x\in[\frac{1}{3};\frac{2}{5}]\\3x-1+2-5x=5\end{cases}\\\begin{cases}x\in(\frac{2}{5};+\infty)\\3x-1+5x-2=5\end{cases}\end{array}\right.\Rightarrow\left[\begin{array}{l}\begin{cases}x\in(-\infty;\frac{1}{3})\\x=-\frac{1}{4}\end{cases}\\\begin{cases}x\in[\frac{1}{3};\frac{2}{5}]\\x=-2\end{cases}\\\begin{cases}x\in(\frac{2}{5};+\infty)\\x=1\end{cases}\end{array}\right.\Rightarrow\left[\begin{array}{l}x=-\frac{1}{4}\\\varnothing\\x=1\end{array}\right.\Rightarrow\left[\begin{array}{l}x=-0,25\\x=1\end{array}\right.$$

✓

Պատ.: $x\in\left[-0,25\right.$

3. $\sqrt{x-0,1}\,\log_{0,1}(3-10x)\geq 0$

$$\begin{cases}x-0,1\geq 0\\3-10x>0\\\log_{0,1}(3-10x)\geq 0\end{cases}\Rightarrow\begin{cases}x\geq 0,1\\x<0,3\\3-10x\leq 1\end{cases}\Rightarrow\begin{cases}x\in[0,1;+\infty)\\x\in(-\infty;0,3)\\x\in[0,2;+\infty)\end{cases}\Rightarrow\begin{cases}x\in[0,1;0,3)\\x\in[0,2;+\infty)\end{cases}\Rightarrow$$

$\Rightarrow x\in[0,2;0,3)\cup\{0,1\}$

Պատ.: $x\in[0,2;0,3)$?

4. P-ի ի՞նչ արժ.

$y=3x^2+px+4$

$y=-x^2+7x+p$

գծի հավասարում

p - ?

[illegible] ֆունկցիաների գրաֆիկները [illegible]

$3x^2 + px + 4 = -x^2 + 7x + p \Rightarrow 4x^2 + (p-7)x + 4 - p = 0$ (1)

[illegible] (1) [illegible]

$D < 0$

$(p-7)^2 - 16(4-p) < 0 \Rightarrow p^2 - 14p + 49 - 64 + 16p < 0 \Rightarrow$

$\Rightarrow p^2 + 2p - 15 < 0$

$p \in (-5; 3)$

Պտ: $p \in (-5; 3)$ ✓

5. $(a+1)x^2 - (a+1)x - 3 \le 0$

$x \in R$

$a - ?$

$$\left[\begin{array}{l} \begin{cases} a+1 \ne 0 \\ D \le 0 \\ a+1 < 0 \end{cases} \\ \begin{cases} a+1 = 0 \\ -3 \le 0 \end{cases} \end{array}\right. \Rightarrow \left[\begin{array}{l} \begin{cases} a < -1 \\ (a+1)^2 + 12(a+1) \le 0 \end{cases} \\ a = -1 \end{array}\right. \Rightarrow \left[\begin{array}{l} \begin{cases} a \in (-\infty; -1) \\ (a+1)(a+13) \le 0 \end{cases} \\ a = -1 \end{array}\right. \Rightarrow$$

$$\Rightarrow \left[\begin{array}{l} \begin{cases} a \in (-\infty; -1) \\ a \in [-13; -1] \end{cases} \\ a = -1 \end{array}\right. \Rightarrow a \in [-13; -1]$$ ✓

Պտ: $a \in [-13; -1]$

6. $\begin{cases} x^2 - x \le 0 \\ 3x - 5a > 1 \end{cases}$

[illegible]

$a - ?$

$$\begin{cases} x(x-1) \le 0 \\ x > \frac{1+5a}{3} \end{cases} \Rightarrow \begin{cases} x \in [0; 1] \\ x \in \left(\frac{1+5a}{3}; +\infty\right) \end{cases}$$

[illegible]

$\frac{1+5a}{3} < 1 \Rightarrow a \in (-\infty; 0,4)$ ✓

Պ-ր: $x \in (-\infty; 0,4)$:

1. Լուծել անհավասարումը

$$|x^2+3x-10|+4+2x \geq 0$$

$$|x^2+3x-10| \geq -4-2x$$

$$\left[\begin{array}{l} \left\{\begin{array}{l} -4-2x \geq 0 \\ \left[\begin{array}{l} x^2+3x-10 \geq -4-2x \\ x^2+3x-10 \leq 4+2x \end{array}\right. \end{array}\right. \\ \left\{\begin{array}{l} -4-2x < 0 \\ \cancel{|x^2+3x-10| \geq -4-2x} \end{array}\right. \end{array}\right. \Rightarrow \left[\begin{array}{l} \left\{\begin{array}{l} x \in (-\infty; -2] \\ \left[\begin{array}{l} x^2+5x-6 \geq 0 \\ x^2+x-14 \leq 0 \end{array}\right. \end{array}\right. \\ x \in (-2; +\infty) \\ \cancel{x \in R} \end{array}\right. \Rightarrow$$

$$\Rightarrow \left[\begin{array}{l} \left\{\begin{array}{l} x \in (-\infty; -2] \\ \left[\begin{array}{l} x \in (-\infty; -6] \cup [1; +\infty) \\ x \in \left[\frac{-1-\sqrt{57}}{2}; \frac{\sqrt{57}-1}{2}\right] \end{array}\right. \end{array}\right. \\ x \in (-2; +\infty) \end{array}\right. \Rightarrow \left[\begin{array}{l} \left\{\begin{array}{l} x \in (-\infty; -2] \\ x \in (-\infty; -6] \cup \left[\frac{-1-\sqrt{57}}{2}; +\infty\right) \end{array}\right. \\ x \in (-2; +\infty) \end{array}\right. \Rightarrow$$

$$\Rightarrow \left[\begin{array}{l} x \in (-\infty; -6] \cup \left[\frac{-1-\sqrt{57}}{2}; -2\right] \\ x \in (-2; +\infty) \end{array}\right. \Rightarrow x \in (-\infty; -6] \cup \left[\frac{-1-\sqrt{57}}{2}; +\infty\right)$$

Պ-ր: $x \in (-\infty; -6] \cup \left[-\frac{1+\sqrt{57}}{2}; +\infty\right)$

5

$$|x^2+3x-10| \geq \underline{-2x-4}$$

$$\begin{cases} -2x-4 \geq 0 \\ x^2+3x-10 \geq -2x-4 \\ x^2+3x-10 \leq 2x+4 \end{cases} \Rightarrow \begin{cases} 2x \leq -4 \\ x^2+5x-6 \geq 0 \\ x^2+x-14 \leq 0 \end{cases} \Rightarrow \begin{cases} x \leq -2 \\ x \in (-\infty; -6] \cup [1; +\infty) \Rightarrow \\ x \in \left[-1-\sqrt{57}/2); \frac{-1+\sqrt{57}}{2}\right] \end{cases}$$

$$x_{12} \begin{matrix} \nearrow -6 \\ \searrow 1 \end{matrix}$$

$$x_{12} = \frac{-1 \pm \sqrt{1+56}}{2} \begin{matrix} \nearrow (-1-\sqrt{57})/2 \\ \searrow (-1+\sqrt{57})/2 \end{matrix}$$

$$\Rightarrow \begin{matrix} x \in (-\infty; -6] \\ x \in \end{matrix}$$

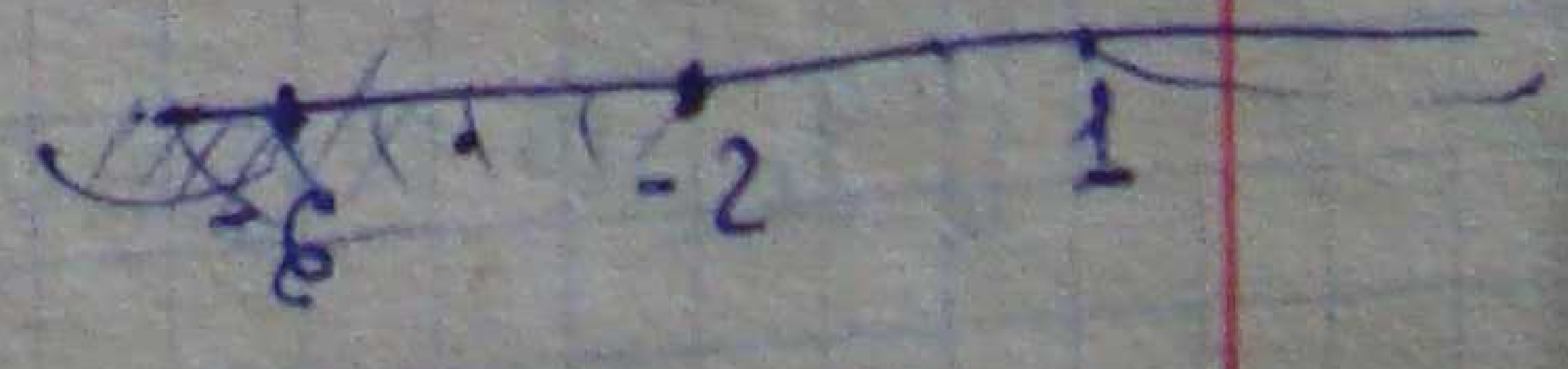
$$|x^2+3x-10| + 4+2x \geq 0$$

$$|x^2+3x-10| \geq -4-2x$$

$$\left[\begin{matrix} \begin{cases} -4-2x \geq 0 \\ x^2+3x-10 \geq -4-2x \\ x^2+3x-10 \leq 4+2x \end{cases} \Rightarrow \begin{cases} 2x \leq -4 \\ x^2+5x-6 \geq 0 \\ x^2+x-14 \leq 0 \end{cases} \Rightarrow \begin{cases} x \in (-\infty; -2] \\ x \in (-\infty; -6] \cup [1; +\infty) \Rightarrow \\ x \in \left[\frac{-1-\sqrt{57}}{2}; \frac{\sqrt{57}-1}{2}\right] \end{cases} \\ \begin{cases} -4-2x < 0 \\ x \in R \end{cases} \Rightarrow \begin{cases} x > -2 \\ x \in R \end{cases} \Rightarrow x \in (-2; +\infty) \end{matrix} \right.$$

$$x_{12} = \frac{-5 \pm \sqrt{25+24}}{2} \begin{matrix} \nearrow -6 \\ \searrow 1 \end{matrix}$$

$$x_{12} = \frac{-1 \pm \sqrt{1+56}}{2} \begin{matrix} \nearrow (-1-\sqrt{57})/2 \\ \searrow (-1+\sqrt{57})/2 \end{matrix}$$



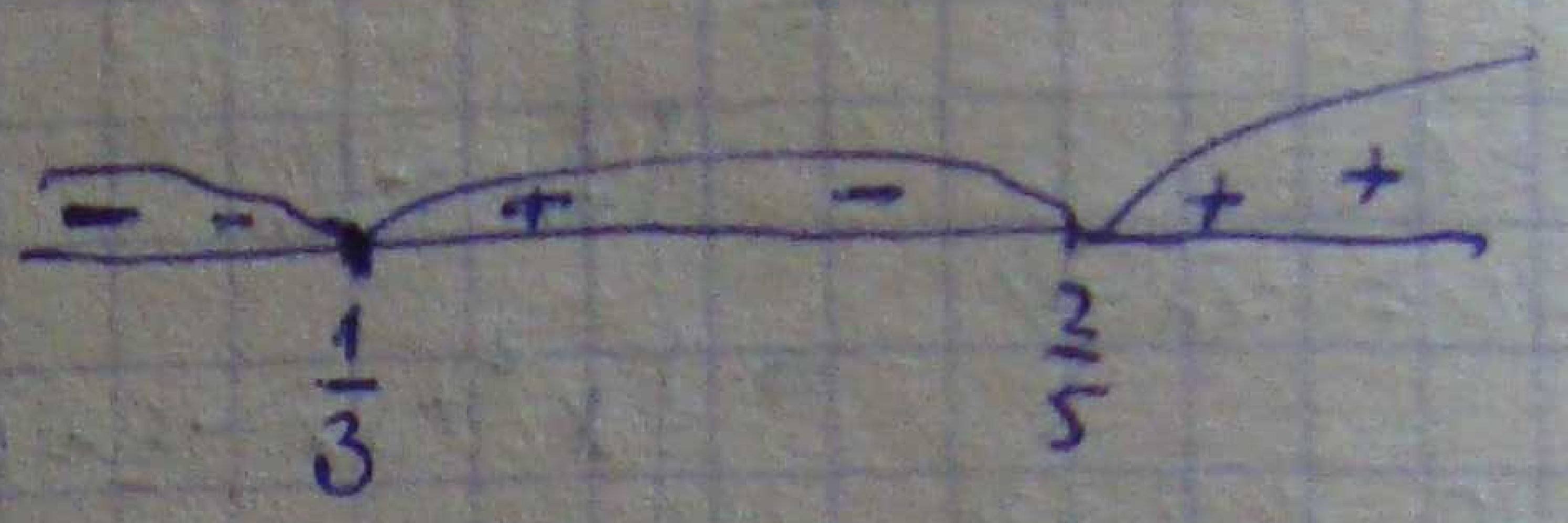
-1-

$$\Rightarrow \left[\begin{matrix} x \in (-\infty; -6] \\ x \in \left[-\frac{1-\sqrt{57}}{2}; \frac{\sqrt{57}-1}{2}\right] \end{matrix} \right. \Rightarrow x \in \varnothing$$

$|3x-1| + |5x-2| = 5$

$3x-1=0 \quad 5x-2=0$

$x = \frac{1}{3} \quad x = \frac{2}{5}$



$$\left[\begin{array}{l} \begin{cases} x \in (-\infty; \frac{1}{3}) \\ 1-3x+2-5x=5 \end{cases} \\ \begin{cases} x \in [\frac{1}{3}; \frac{2}{5}] \\ 3x-1+2-5x=5 \end{cases} \\ \begin{cases} x \in (\frac{2}{5}; +\infty) \\ 3x-1+5x-2=5 \end{cases} \end{array}\right. \Rightarrow \left[\begin{array}{l} \begin{cases} x \in (-\infty; \frac{1}{3}) \\ 8x=-2 \end{cases} \\ \begin{cases} x \in [\frac{1}{3}; \frac{2}{5}] \\ 2x=-4 \end{cases} \\ \begin{cases} x \in (\frac{2}{5}; \infty) \\ 8x=8 \end{cases} \end{array}\right. \Rightarrow \left[\begin{array}{l} \begin{cases} x \in (-\infty; \frac{1}{3}) \\ x=-\frac{1}{4} \end{cases} \\ \begin{cases} x \in [\frac{1}{3}; \frac{2}{5}] \\ x=-2 \end{cases} \\ \begin{cases} x \in (\frac{2}{5}; +\infty) \\ x=1 \end{cases} \end{array}\right. \Rightarrow$$

$$\Rightarrow \left[\begin{array}{l} x=-\frac{1}{4} \\ \varnothing \\ x=1 \end{array}\right. \qquad m_r : -\frac{1}{4}; 1$$

3. $\sqrt{x-0{,}1}\ \log_{0{,}1}(3-10x) \geq 0$

$$\begin{cases} x-0{,}1 \geq 0 \\ 3-10x>0 \\ \log_{0{,}1}(3-10x) \geq 0 \end{cases} \Rightarrow \begin{cases} x \geq 0{,}1 \\ x<0{,}3 \\ 3-10x \leq 1 \end{cases} \Rightarrow \begin{cases} x \in [0{,}1; +\infty) \\ x \in (-\infty; 0{,}3) \\ x \in [0{,}2; +\infty) \end{cases} \Rightarrow$$

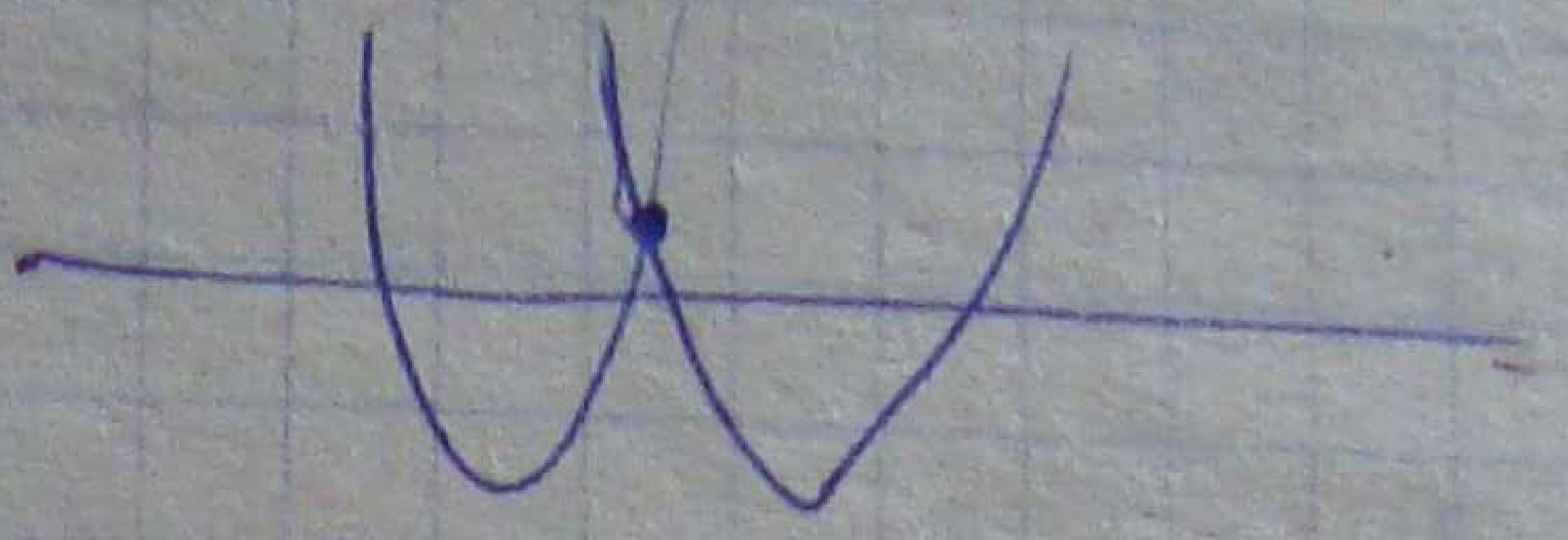
$$\Rightarrow \begin{cases} x \in [0{,}2; +\infty) \\ x \in (-\infty; 0{,}3) \end{cases} \Rightarrow$$

$0{,}1^{\log_{0{,}1}(3-10x)} \qquad 0{,}1^{0}$

$3- \qquad 10x \geq 2$

$x > 0{,}2$

$\Rightarrow x \in [0{,}2; 0{,}3)$



$3x^2 + px + 4 = -x^2 + 7x + p$

$4x^2 + (p-7)x + 4 - p = 0$

$D < 0$

$(p-7)^2 - 16(4-p) < 0$

$p^2 - 14p + 49 - 64 + 16p < 0$

$p^2 + 2p - 15 < 0$

$p \in (-5; 3)$

$\begin{array}{r} 64 \\ -49 \\ \hline 15 \end{array}$

$x \in R$

a -?

$(a+1)x^2 - (a+1)x - 3 \le 0$

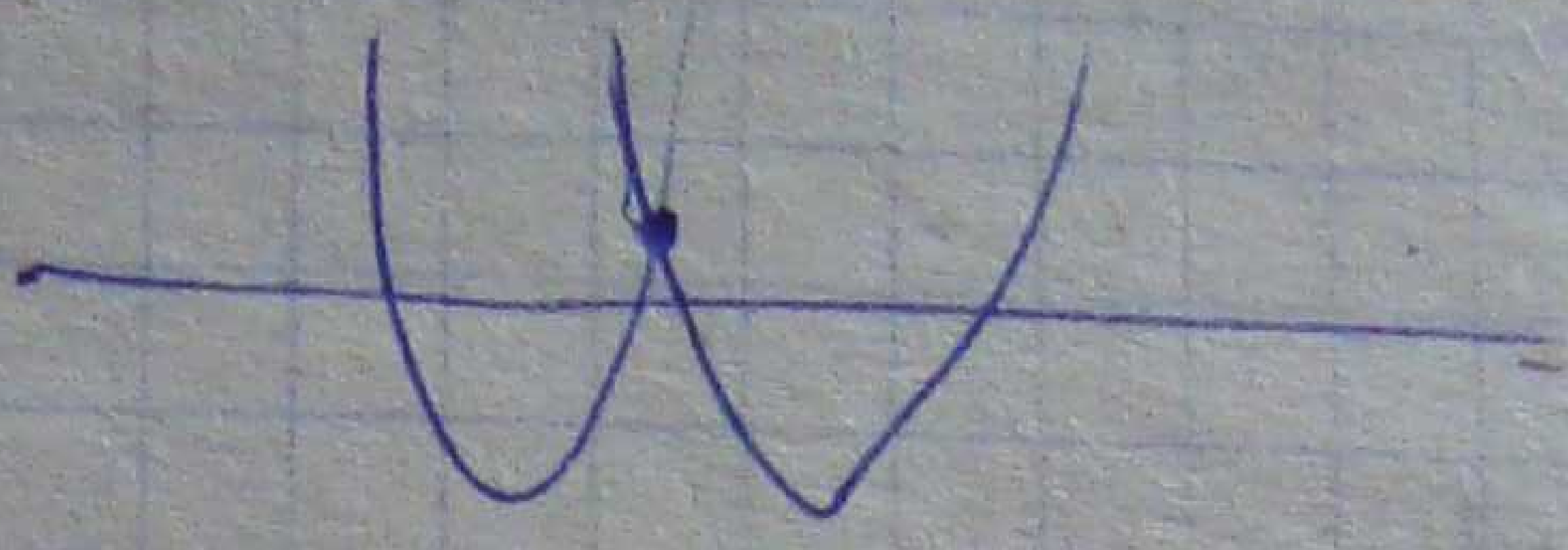
$$\left[\begin{array}{l} \begin{cases} a+1 \ne 0 \\ D \le 0 \\ a+1 < 0 \end{cases} \\ \begin{cases} a+1 = 0 \\ -3 \le 0 \end{cases} \end{array}\right. \Rightarrow \left[\begin{array}{l} \begin{cases} a < -1 \\ (a+1)^2 + 12(a+1) \le 0 \end{cases} \\ a = -1 \end{array}\right. \Rightarrow$$

$$\Rightarrow \left[\begin{array}{l} \begin{cases} a \in (-\infty; -1) \\ (a+1)(a+13) \le 0 \end{cases} \\ a = -1 \end{array}\right. \Rightarrow \left[\begin{array}{l} \begin{cases} a \in (-\infty; -1) \\ a \in [-13; -1] \end{cases} \\ a = -1 \end{array}\right. \Rightarrow \begin{cases} a \in [-13; -1) \\ a = -1 \end{cases} \Rightarrow$$

$\Rightarrow a \in [-13; -1]$

$\Rightarrow$

3)



$3x^2+px+4=-x^2+7x+p$

$4x^2+(p-7)x+4-p=0$

$D<0$

$(p-7)^2-16(4-p)<0$

$$\begin{array}{r}64\\-49\\\hline 15\end{array}$$

$p^2-14p+49-64+16p<0$

$p^2+2p-15<0$

$p\in(-5;3)$

$x\in R$
$a\ -?$

$(a+1)x^2-(a+1)x-3\le0$

$$\left[\begin{array}{l}\begin{cases}a+1\neq0\\ D\le0\\ a+1<0\end{cases}\\ \begin{cases}a+1=0\\ -3\le0\end{cases}\end{array}\right.\Rightarrow\left[\begin{array}{l}\begin{cases}a<-1\\ (a+1)^2+12(a+1)\le0\end{cases}\\ a=-1\end{array}\right.\Rightarrow$$

$$\Rightarrow\left[\begin{array}{l}\begin{cases}a\in(-\infty;-1)\\ (a+1)(a+13)\le0\end{cases}\\ a=-1\end{array}\right.\Rightarrow\left[\begin{array}{l}\begin{cases}a\in(-\infty;-1)\\ a\in[-13;-1]\end{cases}\\ a=-1\end{array}\right.\Rightarrow\begin{cases}a\in[-13;-1)\\ a=-1\end{cases}\Rightarrow$$

$$\Rightarrow a\in[-13;-1]$$

$$\begin{cases} x^2 - x \le 0 \\ 3x - 5a > 1 \end{cases}$$

$$\begin{cases} x(x-1) \le 0 \\ x > \frac{1+5a}{3} \end{cases} \Rightarrow \begin{cases} x \in [0;1] \\ \frac{1+5a}{3} < 0 \end{cases}$$

$$1 + 5a < 1$$

$$\cancel{a < -\frac{1}{5}}$$

$$5a < 0$$

$$a < 0$$

$$|x^2 + 3x - 10| + 4 + 2x \ge 0$$

$$|x^2 + 3x - 10| \ge -4 - 2x$$

$$\left[\begin{array}{l} \begin{cases} -4-2x \ge 0 \\ \left[\begin{array}{l} x^2+3x-10 \ge -4-2x \\ x^2+3x-10 \le 4+2x \end{array}\right. \end{cases} \\ -4-2x < 0 \\ \cancel{x \in R} \; |x^2+3x-10| \ge -4-2x \end{array}\right. \Rightarrow \left[\begin{array}{l} \begin{cases} x \in (-\infty;-2] \\ \left[\begin{array}{l} x^2+5x-6 \ge 0 \\ x^2+x-14 \le 0 \end{array}\right. \end{cases} \\ x \in (2;+\infty) \end{array}\right. \Rightarrow$$

$$2x \le -4$$

$$x \le -2$$

$$\Rightarrow \left[\begin{array}{l} \begin{cases} x \in (-\infty;-2] \\ \left[\begin{array}{l} x \in (-\infty;-6] \cup [1;+\infty) \\ x \in \left[\frac{-1-\sqrt{57}}{2}; \frac{\sqrt{57}-1}{2}\right] \end{array}\right. \end{cases} \\ x \in (2;+\infty) \end{array}\right. \Rightarrow \left[\begin{array}{l} \begin{cases} x \in (-\infty;-2] \\ x \in (-\infty;-6] \cup \left[-\frac{1-\sqrt{57}}{2};+\infty\right) \end{cases} \\ x \in (2;+\infty) \end{array}\right. \Rightarrow$$

$$\Rightarrow \left[\begin{array}{l} x \in (-\infty;-6] \cup \left[-\frac{1-\sqrt{57}}{2};-2\right] \\ x \in (2;+\infty) \end{array}\right. \Rightarrow$$

$\Rightarrow x \in (-\infty; -6] \cup \left[\frac{-1-\sqrt{57}}{2}; +\infty\right)$